



KEY POINT SUMMARY

OBJECTIVES

This study investigated the relationships between the presence of indoor plants in a hospital room, perceived stress level, and perceived attractiveness in order to better understand how and why these responses take place, and identify whether attractiveness may influence stress levels.

Stress-Reducing Effects of Indoor Plants in the Built Healthcare Environment: The Mediating Role of Perceived Attractiveness

Dijkstra, K., Pieterse, M.E., Pruyn, A.
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Key Concepts/Context

Previous research findings have demonstrated that the presence of natural elements such as plants and other interior features can promote patients' recovery from stress and increase pain tolerance. Research has likewise provided evidence that people have an innate tendency to respond positively to natural elements, and that these can contribute to a more positive impression of healthcare settings. Environments that are perceived to be more attractive also have been shown to have beneficial effects such as reducing stress or improving impressions of quality of care. In reviewing the body of research to date, the authors suggest however, that underlying processes at work here are not yet well understood.

This study set out to identify the underlying mechanisms of stress-reduction responses and to explore how attractiveness, stress, and exposure to natural elements influence one another. In the study, participants were asked to imagine having an illness and then shown either an image of a hospital room with plants or an image of the same room with artwork depicting an urban image (no plants). By exposing participants to hospital rooms with and without indoor plants, the study explored whether the presence of indoor plants reduced feelings of stress and whether those effects were influenced by the fact that people found the environments with indoor plants more attractive. The aim was to separate attractiveness and exposure to plants as they relate to levels of perceived stress in order to inform design decisions.



DESIGN IMPLICATIONS

Providing indoor plants in hospital rooms can offer simple and cost-effective stress-reducing effects, particularly where direct access to natural elements might be constrained by location or resources.

Indoor plants can increase perceived attractiveness, which in turn can reduce perceived stress and contribute to healing.

While the infection risks of indoor plants must be considered in healthcare settings, their healing potential could be considered in appropriate locations.

Methods

The study used a single-factor between-subjects experimental design in which 77 (35 male and 42 female) participants were presented with a scenario describing hospitalization with a possible Legionella diagnosis. It was conducted in the Netherlands in March-May of 2007. Participants were asked to imagine themselves with a headache and other symptoms of possible infection and were then exposed to one of two photographs of a hospital room, one with indoor plants and one with a painting of an urban environment and no plants. The painting was added to the no plants room to offer an alternative distraction. After viewing the photographs, participants were asked to complete two bipolar (opposite) adjective rating scales: one to report perceived stress levels (e.g., whether the respondent felt “tense” or “uptight” on an 18-point Stress Arousal Checklist) and another to rate perceived attractiveness of the room in the photograph (e.g., how the participant rated the room as “beautiful or ugly,” “friendly or unfriendly” on a scale of 1-5). The average score on each test was used as a measure of stress and attractiveness, respectively. Independent samples *t*-tests were used to test the effect of the hospital room with plants or the hospital room without plants on reported feelings of stress. To test the relationship between perceived attractiveness and stress, two mediation analyses were conducted using regression analysis: one to test whether attractiveness influenced the relationship between plants and stress and another to assess whether both plants and attractiveness predicted lower stress.

Findings

- According to the study results, participants rated their stress levels lower when imagining themselves in the hospital room with indoor plants, compared to a room with a painting and no plants. The study found that a statistically significant proportion of participants imagining themselves in a hospital room with indoor plants perceived less stress than those in a hospital room with the painting and no plants ($p=0.022$).
- The second part of the study sought to understand the relationships among stress, natural elements, and attractiveness and found that the presence of plants did predict higher perceptions of attractiveness ($p=0.017$). Participants rated the hospital rooms with indoor plants as being more attractive. Further tests indicated support for the mediating effect of attractiveness on the relationship between the presence of indoor plants and perceived stress ($p=0.042$).
- These findings confirmed that plants do have stress-reducing effects and that the presence of plants can lead to higher perceived attractiveness of a room which, in turn, leads to reduced feelings of stress in patients. The study lends support to the hypothesis that indoor plants are stress reducers because they contribute to higher perceived attractiveness.



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Limitations

- In response to the potential concern that the findings might not be transferable to a real hospital setting because the study simulated a hospital stay, the authors cite evidence from previous studies that demonstrate that photographs can accurately simulate real environments. They added that other studies have shown that if participants are asked to image a possible hospitalization scenario, results from the simulated environment closely match field results.
- The study did not consider whether gender influenced stress or attractiveness ratings.
- The addition of the painting to the photograph of the room “without indoor plants” introduces a feature not present in the “with indoor plants” photograph and could have influenced the results.